



Mount Rainier National Park

Sister Mountain Project

Life and Death on the Mountain

Overview	Children love to play hide and seek. As it turns out so do plants, prey, and predators! In this activity students will become the hunters, the hunted, and the hiders. Or in ecological terms-the apex consumers, primary consumers, and the primary producers. Be ready to run, and hunt for your food before winter comes and you are left without a meal!
Grade Level	5-8
Objectives	<ul style="list-style-type: none">• Students will identify examples of adaptations in producers, prey, and predators of one of Mount Rainier's four primary life zones.• Students will describe the importance of adaptations in these organisms in order to stay alive and pass on their genetic information to the next generation.
Setting	Outdoors in one of Mount Rainier's four major life zones, or a playing field with places to hide.
Timeframe	Preparation-10 minutes Activity-30 minutes
Materials	<ul style="list-style-type: none">✓ Three different colored bandanas (green, brown, red)✓ Outdoor area such as a thicket or other vegetated area free of poisonous or sensitive plants and other hazards where students can hide safely✓ Whiteboard and✓ Dry-erase markers to graph the wildlife population dynamics season-to-season
Vocabulary	Adaptation, Predator, Prey, Apex, Keystone, Consumer, Producer, Trophic Level, Food Chain
Standards	<p>6-8 LS2B Energy flows through an ecosystem from producers (plants) to consumers to decomposers.</p> <p>6-8 LS2C The major source of energy for ecosystems on Earth's surface is sunlight. Producers transform the energy of sunlight into the chemical energy of food through photosynthesis. This food energy is used by plants, and all other organisms to carry on life processes. Nearly all organisms on the surface of Earth depend on this energy source.</p> <p>6-8 LS2E Investigations of environmental issues should uncover factors causing the problem and relevant scientific concepts and findings that may inform an analysis of different ways to address the issue.</p>

	<p>6-8 SYSA Any system may be thought of as containing subsystems and as being a subsystem of a larger system</p> <p>6-8 SYSB The boundaries of a system can be drawn differently depending on the features of the system being investigated, the size of the system, and the purpose of the investigation.</p> <p>6-8 SYSF The natural and designed world is complex; it is too large and complicated to investigate and comprehend all at once. Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as "systems."</p> <p>6-8 INQE – Model – <u>Models</u> are used to represent objects, events, <u>systems</u>, and processes. Models can be used to test hypotheses and better understand <u>phenomena</u>, but they have limitations.</p>
Background	<p>Animals on Mount Rainier are adapted to their environment in order to survive. Animals may also be adapted to changes in their habitats. For example, snowshoe hares have a white winter coat to blend with a snowy environment and a tan summer coat to blend in with summer ground and vegetation colors. Black tailed deer fawns have spotted hair that resembles dappled light on the forest floor in spring and produce no odor that possible predators could detect. And pacific tree frogs can change color to blend with their riparian surroundings. Adaptations to predator and prey relationships may also include behavior (e.g., hiding or flight) and physical (e.g., camouflage) variations.</p>
Procedure	<ol style="list-style-type: none"> 1. Take the class to one of Mount Rainiers four primary life zones (low-elevation, mid-elevation, subalpine forest/meadow, alpine). *Make sure you will not destroy any vegetation! 2. Number the class off by 4's (1, 2, 3, 4...) 3. Have all the 1's and 2's take a green bandana and tie it around their head-this is the producer, or plant group. For this activity have the plants be thimbleberries for low-elevation forest. Huckleberry for mid-elevation forest. Beargrass for subalpine. And lichen for alpine. 4. Have all the 3's take a brown bandana and tie it around their head-this is the primary consumer, or prey group. For this activity have the primary consumers be voles for low-elevation forest. Garter snakes for mid-elevation forest. Marmot for subalpine. And pika for alpine. 5. Have all the 4's take a red bandana and tie it around their head-this is the apex consumer, or keystone predator of the game. For this activity have the apex consumers be bobcats for low-elevation forest. Great horned owl for mid-elevation forest. American kestrel for subalpine. And golden eagle for alpine. 6. Once all the students have bandanas and know which group they are in have each of the three groups huddle up and create a cheer, or "battle cry"

7. Explain the playing boundary and rules of the game: plants hide and cannot move due to the fact that plants have roots and must stay "rooted" but can sway from side to side to hide from primary consumers. If a plant does not get eaten by a primary consumer, they will remain a plant for the next round. Primary consumers can run and find plants to eat to stay alive. If a primary consumer eats they will remain a primary consumer for the next round, but if they can not find any plants to eat before you shout "winter's coming!" they will die and become a plant for the next round of the game. Predators can run and find primary consumers to eat, but if they do not find any primary consumers to eat (e.g., pika, hare, marmot, snake) before you shout "winter's coming!" then they will die and become a plant for the next round. If they eat they will stay a predator. Remember the goal of this game is not to become the apex predator, but to remain what you started out as!
8. Create a line graph with the x-axis being the population size of each of the three groups. The y-axis will be each season-or round-play 5-10 rounds. Use three different colored dry-erase markers for each group to graph each season's results.
9. Plot the beginning group population numbers on the line graph for season 1.
10. Explain to students that we will be observing how wildlife populations on Mount Rainier fluctuate due to what resources are available.
11. Allow all the plants to go hide in the life zone you have chosen. They will have 2 minutes to hide.
12. After 2 minutes have passed allow the primary consumers group to go find plants to eat. They will have 1 minute to go eat and hide from the predators that will be coming for them soon!
13. After 1 minute has passed to allow the primary consumers time to eat and hide the predators will be released to seek out the primary consumers. *Remember that the predators can only eat the primary consumers-not the plants because they are carnivores!
14. Allow the game to go on for 5 minutes. After 5 minutes yell out, "winter's coming!" this will signify the end of each round. Have all the players come back to the designated meeting place and graph the results.
15. If a plant survived they stay a plant. If they got eaten they become a primary consumer. Primary consumer will stay primary consumers if they ate a plant, if not they die and become a plant. If the primary consumer got eaten by a predator they become a predator. Predators stay a predator if they ate a primary consumer. If not they die and become a plant. Graph the results and discuss with the class why the populations changed. Ask for predictions for what will happen in the next round. *Don't forget to change headbands if the kids change groups!

	<p>16. Play 4-9 more rounds and continue to graph results after each round-or season.</p> <p>17. Discuss the line graph after the game is over and talk about adaptations in animals, hunting, and hiding techniques and population dynamics due to carrying capacity and limiting factors-refer to Wild Wapiti game.</p>
Suggested Assessment	<ul style="list-style-type: none"> • Have students copy the line graph and write a conclusion to the activity using data to support their conclusion. • Have students describe the importance of adaptations to animals. Give at least two examples of animal adaptations. • Create a play or skit that shows how predators, prey and plants are adapted to survive on Mount Rainier.
Adaptations	<p>This game can be adapted to play in most any type of habitat that you might find yourself in! Play on the mountain, the meadows, the beach or the city. All you need to do is find a predator, prey and producer in your given habitat to have students become in order to play the game!</p>
References/ Resources	<p>Council for Environmental Education. (2008). Project Wild: K-12 Curriculum and Activity Guide. Houston, TX: Author.</p>